**Patent Claims:**

1. A method for producing photoresist structures for which a volume of photosensitive material (5) is exposed at least once by means of at least two light beams (1, 2), which are superposed inside the photosensitive material (5), and is then subjected to a developing process, wherein the light beams (1, 2) penetrate at least one transparent optical element (3), characterized in that the optical element (3) is a polyhedron with planar or curved surfaces.

2. The method for producing photoresist structures according to claim 1, characterized in that a partial prism with planar surfaces is used for the polyhedron.

3. The method for producing photoresist structures according to claim 2, characterized in that the partial prism takes the form of a pyramid.

4. The method for producing photoresist structures according to claim 2, characterized in that the partial prism is a truncated pyramid.

5. The method for producing photoresist structures according to claim 1, characterized in that a spherical segment is used as polyhedron.

6. The method for producing photoresist structures according to one of the claims 1 to 5, characterized in that the volume of photosensitive material (5) is deposited directly onto one of the optical elements (3).

7. The method for producing photoresist structures according to one of the claims 1 to 6, characterized in that two optical elements are used, with the volume of photosensitive material (5) disposed in-between.

8. The method for producing photoresist structures according to one of the claims 1 to 7, characterized in that an immersion substance (4) is disposed between at least one of the optical elements (3) and the volume of photosensitive material (5).

9. The method for producing photoresist structures according to one of the claims 1 to 8, characterized in that the light beams (1, 2) are adjusted independent of each other with respect to intensity, phase and polarization.

10. The method for producing photoresist structures according to one of the claims 1 to 9, characterized in that the volume of photosensitive material (5) is exposed at least twice and that between the exposures, the light beams (1, 2) and the volume of photosensitive material (5) are moved relative to each other.

11. The method for producing photoresist structures according to one of the claims 1 to 10, characterized in that individual regions on the surface of the volume of photosensitive material (5) are covered with at least one shadow mask.

12. The method for producing photoresist structures according to one of the claims 1 to 11, characterized in that the volume of photosensitive material (5) is additionally subjected to exposure by means of a single beam.

13. The method for producing photoresist structures according to one of the claims 1 to 12, characterized in that the volume of photosensitive material (5) is divided into segments.

14. The method for producing photoresist structures according to one of the claims 1 to 13, characterized in that the volume of photosensitive material is deposited on top of another volume of photosensitive material which is exposed by means of at least one beam.

15. A photoresist structure produced according to a method as defined in the claims 1 to 14.